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efforts made by that company to diminish the influence of the Banyans or East Indian merchants, who are the most honest and enterprising traders of these parts. The English company will take care to avoid this mistake. The number of East Indians now residing in Zanzibar amounts to 7,000. The Banyans proper antedate the Portuguese in these parts.

H. TROGNOTZ gives the following as the correct areas of the countries of South America according to the latest data :

Brazil	-	8,361,350	Peru	-	-	1,137,000
Dutch Guiana	-	78,900	Bolivia	-	-	1,334,200
French Guiana		129,100	Chili	-	-	776,000
British Guiana	-	229,600	Argentine Republic			2,789,400
Venezuela	-	1,043,900	Uruguay	-	-	178,700
Columbia	-	1,203,100	Paraguay	-	-	253,100
Ecuador	-	299,600				

17,813,950

This is exclusive of the Falkland and Galapagos Islands.

## GEOLOGY AND PALÆONTOLOGY.

PRESTWICH ON UNDERGROUND TEMPERATURES.<sup>1</sup>—The author treats the subject solely from the geological point of view. He gives tables of temperatures of coal mines, of mineral mines, of artesian wells, and bore-holes, and of tunnels. After rejecting all doubtful and uncertain cases he obtains the following values for their several gradients:

				Thermometric gradient, per 1° Fahr.
Coal mines	-	-	-	49.5 feet.
Mineral mines	-	-	-	43.2 "
Artesian wells	-	-	-	50.0 "

The mean of the three thus gives a general thermometric gradient of 47.5 feet per degree. In view, however, of the many causes which have interfered with the value of even the best observations, the author thinks it may be a question whether a general average gradient of 45 feet per degree would not be nearer the true normal.

<sup>1</sup> On Underground Temperatures, with Observations on the Conductivity of Rocks; On the Thermal Effects of Saturation and Inhibition; and On a Special Source of Heat in Mountain Ranges. By Joseph Prestwich, M. A., F. R. S. Extract from Proc. Roy. Soc., 1886.

DAVIDSON'S MONOGRAPH OF RECENT BRACHIOPODA.<sup>1</sup>—During the last hundred years the recent Brachiopoda have attracted considerable attention, and a large number of valuable papers have been published upon them, but no satisfactory general monograph treating of the shell and animal *conjointly* has appeared. This omission Davidson has supplied. The literature of the subject is voluminous and the labor of collating and revising alone has been enormous, but the result is a book the student will appreciate. The descriptions are characterized by a clearness and precision that shows the master. The numerous plates drawn by the author are exceptionally fine.

To Miss Agnes Crane is due the credit of editing this able work. Previous to Dr. Davidson's lamented death Miss Crane had been studying the Brachiopoda under his guidance, and at his request the proof-sheets of this memoir were read by her on the author's behalf.

BARROIS' FAUNE DU CALCAIRE D'ERBRAY<sup>2</sup>—A large quarto of 346 pages and 17 plates. After a brief introduction, in which the author gives his views of the formation of the *Calcaire d'Erbray*, follow five chapters devoted respectively to the Stratigraphy; the Description of 200 Species of Invertebrate fossils found in the *Calcaire d'Erbray*; Discussion of Former Works on the Fauna of Erbray; a Comparison of the Fauna of *Calcaire d'Erbray*, with Equivalent Faunas of Other Regions; General Considerations on the Fauna of *Erbray*. In conclusion the author remarks: "Les calcaires ou plutôt les récifs coralliens du Harz, d'Erbray, appartiennent pour nous, à l'étage Gedinnien; ceux de Bretagne et d'Espagne, à l'étage Coblenzien; ceux de Cabrières à l'étage Eifélien; ceux des Ardennes, aux étages Gévétien et Frasnien. L'identité de leurs conditions de formation a pu, a dû même dans certains cas, donner aux faunes successives de ces calcaires plus d'analogies entre elles, qu'avec les faunes synchroniques de faciès différent."

GAUDRY SUR LES DIMENSIONS GIGANTESQUES DE QUELQUES MAMMI FÈRES FOSSILES<sup>3</sup>—A short paper in which the

<sup>1</sup>A Monograph of Recent Brachiopoda, by Thomas Davidson. Extract from the Trans. Linnean Soc. of London, Vol. iv., part 1, 1886.

<sup>2</sup>Faune du Calcaire d' Erbray. Par Charles Barrois. Contribution à l'Etude du Terrain Devonien de l'Ouest de la France. 1889.

<sup>3</sup>Sur les dimensions gigantesques de quelques Mammifères fossiles. Par M. Albert Gaudry. Extrait des Comptes rendus des Séances de l' Académie des Sciences t. CVII, 1888.

author gives the following table of the comparative size of some of the fossil mammalia :

Premier rang.....	<i>Dinotherium giganteum</i> du Miocene superieure de l'Attique.
Deuxième rang.....	<i>Elephas antiquus</i> du quaternaire (phase chaude) des environs de Paris.
Troisième rang.....	<i>Elephas meridionalis</i> du pliocene superieure de Durfort.
Quatrième rang.....	<i>Mastodon americanus</i> du plistocene des Etats-Unis.
Cinquième rang.....	<i>Elephas primigenius</i> du plistocene de Siberie (phase froide); et Elé- phants actuels.

THE PLISTOCENE LAKE OF NEBRASKA.—Prof. J. E. Todd (*Proceedings Am. Association for Adv. of Science*) calls attention to several facts, hitherto unpublished, which indicate that eastern Nebraska, western Iowa, and south-east Dakota were occupied by a fresh water lake when the drift first began to be deposited in that region. The facts and considerations are as follows:

1. An extensive deposit of fine sand, containing a few fossil bones, overlain in some places by a lead-colored clay without pebbles, and some fossiliferous silt resembling loess, is found occupying much of the region, especially the lower levels. Ten localities were mentioned where these formations have been observed, the more notable being at Fairview, Dak., Mills Co., Iowa, and Lancaster Co., Neb. A large fossil claw of some gigantic mammal (*Megalonyx*) was shown, which was obtained from Mills Co., Iowa, in the sand below the drift.

2. The occurrence of a stratum of volcanic ashes in such position as to show that wide areas were occupied by still water, just preceding the deposition of the drifts in some parts and during it in others. The localities described and pictured were in Knox Co., Neb., and near West Point, Neb.

3. An objection which may be urged, from the depth of the channel of the Missouri River in this region, is removed by several facts which go to show that said channel has been wholly excavated since the glacial epoch.

(a). The rock under the present bed is unglaciated and unoccupied by drift deposits as has been recently demonstrated

by observations made in sinking piers of bridges at Blair and Omaha.

(b). The Missouri is still deepening its trough with every flood. This has been determined by soundings at such times.

This fresh water lake, from its time and location, may be quite confidently considered a portion of the great body of water which occupied the western plains during late Tertiary times, and which was named by King, Lake Cheyenne.

GEOLOGICAL NEWS.—GENERAL.—The Rev. B. Baron states his belief, derived from an examination of the flora, that Madagascar separated from the African mainland during or even before the early Pliocene. This agrees with the deductions of Wallace. Five-sixths of the plant genera occur elsewhere, but four-fifths of the species are peculiar. The central part of the island is mainly gneiss and other crystalline rocks, with a strip parallel to the main axis of the island, and roughly to that of the crystalline rocks of the continent. The sedimentary strata occur chiefly in the west and south, and comprise eocene, upper cretaceous, neocomian, Oxfordian, lower oolite, and lias. The highest elevations are topped with lava, which is mostly basaltic. There is no active volcano now upon the island.

CAENÖZOIC.—E. T. Newton (Geol. Mag.) describes some recent additions to the preglacial Forest-bed fauna; including *Cervus rectus* n. sp. He refers the bovine remains to *Bison bonasus*, and the phocine to *Phoca barbata*. The narwhal, beluga, and *Phocaena communis* are also added to the list.

Sig. Ristori describes a *Scylla* found near Verona, but not sufficiently well preserved to warrant the formation of a new species, though it evidently differs from *S. serrata* and *S. michelini*, M. Edwd., and also from *S. hassiaca* Th. Ebert. It is the only example of the genus yet found in the Italian Territory.

Sig. Ristori (Boll. Soc. Geol. ii., vii. 188) describes an *Inuus*, *I. caudatus*, from the Pliocene of the Valdarno. This species had previously been erected into the type of a new genus by Igino Cocchi.

*Oreopithecus bimbolia* Gervais, is declared by Sig. Ristori not to be an anthropoid ape, but to appertain to the *Cynopithecinae*. The example is from the Miocene of Montebamboli.

F. Bussane (Boll. Soc. Geol. ii., vii. 1888) describes a species of Ehippus to which he gives the name of *E. nicolosi*, discovered in the middle Eocene of Val Sordino, near Lonigo (Veronese). It is near *E. longipennis*, Ag., but has denticulated spinous rays in dorsal and anal.

From an examination of fossil plants found near Rome, G. Antonelli concludes that in the pliocene period the neighborhood afforded a good number of land and fresh water species, mostly of a woody nature, and identical with recent plants of the same district, so that the climate must have been much the same as now.

The Bolletine of the Geological Society of Italy, 1888, has an account of the pliocene foraminifera of Ca dè Reggio, by Mario Malogili.

G. Ristori describes some Lower Miocene crustacea of Piedmont, including a new Neptunus (*N. convexus*) and *Mursiopsis pustulosus*, nov gen. et. sp., also *Callianassa canaverii* and fragments of unnamed species. *Mursiopsis* belongs to the Calappidae, and has points of resemblance to Hepatus, Mursia, Lambrus, and Calappilia. The carapax is convex in front, reëntering at the sides, and straight behind, and is trilobed like Calappilia or Lambrus.

A new species of Clupea, from the Oligocene strata in the Isle of Wight, is described at length by E. T. Newton, in the *Quarterly Journal of the Geological Society*, February, 1889. As he is unable to refer the specimens to any known species, he proposes the name *Clupea vectensis*.

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## MINERALOGY AND PETROGRAPHY.<sup>1</sup>

PETROGRAPHICAL NEWS.—The palæopicrite<sup>2</sup> of Bottenhorn, Hessen-Nassau, consists essentially of olivine and augite, both of which have yielded interesting alteration products. The olivine, when fresh, is discovered in twins, whose twin-

<sup>1</sup> Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.

<sup>2</sup> Brauns: Zeits. d. deutsch. geol. Gesell. xl., p. 455.